

Remarks

Claims 1 and 3-41 are pending in the subject application. Applicants acknowledge that claims 4, 27, and 28 have been withdrawn from further consideration as being drawn to a non-elected invention. By this Amendment, Applicants have amended claim 1, canceled claims 3-41, and added new claims 42-84. Support for the amendments can be found throughout the subject specification and in the claims as originally filed. Entry and consideration of the amendments presented herein is respectfully requested. Accordingly, claims 1 and 42-84 are currently before the Examiner. Favorable consideration of the pending claims is respectfully requested.

The subject specification has been objected to on the grounds that it does not comply with 37 CFR §1.821(a)(1) and (a)(2) which requires reference in the specification to a particular sequence identifier (SEQ ID NO:) for a nucleic acid or amino acid sequence. The Examiner indicates that sequence identifiers are missing from the legends of the figures or the Brief Description of Figures 2-5 of the subject specification. By this Amendment, Applicants have amended the subject specification to include reference to SEQ ID NOs. in the Brief Description of Figures 2-5 as suggested by the Examiner. Accordingly, reconsideration and withdrawal of the objection is respectfully requested.

The Examiner has also objected to Applicants' claim of priority to U.S. Provisional Application No. 60/085,460, filed May 14, 1998, and U.S. Provisional Application No. 60/031,045, filed November 18, 1996, on the grounds that the '460 and '045 applications were filed more than one year before the filing date of the subject application. As requested by the Examiner, Applicants have amended the "Cross-Reference to Related Applications" section of the specification to clarify that related U.S. Application No. 09/312,433 claims the benefit of provisional Application No. 60/085,460 and related U.S. Application No. 08/972,545 claims the benefit of provisional Application No. 60/031,045. Accordingly, reconsideration and withdrawal of the objection is respectfully requested.

Claims 11-13, 16, 19, 22, 25, 34-36, 38, and 41 are objected to because of various informalities. Applicants gratefully acknowledge the Examiner's careful review of the claims. In accordance with the Examiner's suggestions, Applicants have amended the claims. Accordingly, reconsideration and withdrawal of the objection is respectfully requested.

Claims 30-36 are objected to under 37 CFR §1.75 as being a substantial duplicate of claims 5-8 and 11-13. Applicants have canceled claims 30-36 and respectfully assert that the new claims submitted herewith are not duplicates. Reconsideration and withdrawal of the objection is respectfully requested.

Claims 1, 3, 5-13, 20-26, and 30-41 are rejected under 35 USC §101 because the claimed invention is directed to non-statutory subject matter. Applicants gratefully acknowledge the Examiner's suggestions of suitable claim language. By this Amendment, Applicants have amended claim 1 to recite that the polynucleotide is "purified." In regard to claim 20 (corresponding to new claim 72), Applicants respectfully assert that the claim does not have to indicate that the polynucleotide is comprised within a construct. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §101 is respectfully requested.

Claims 1, 3, 5-26, and 29-41 are rejected under 35 USC §112, first paragraph, as nonenabled by the subject specification and as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner acknowledges that the specification is enabled and provides written description for certain polynucleotides that encode heat stable AGP large subunits from maize. However, the Examiner asserts that the subject specification does not enable and does not provide written description for polynucleotides encoding heat stable mutants of the small subunit of AGP or for starch biosynthesis enzymes other than AGP or for other plants.

Applicants respectfully assert that the claims are enabled by the subject specification and that there is adequate written description in the subject specification to convey to the ordinarily skilled artisan that they had possession of the claimed invention. Applicants note that claim 1 already recites that the polypeptide encoded by the polynucleotide is a plant ADP-glucose pyrophosphorylase (AGP). By this Amendment, Applicants have amended claim 1 to specify that the mutation is in the large subunit of a plant AGP polypeptide. In addition, Applicants respectfully assert that the subject specification does enable the claimed invention for plants other than maize. The sequences of large subunit AGP for numerous plant species other than maize were well known in the art prior to the earliest effective filing date of the subject application. As the Examiner is undoubtedly aware, there

is no requirement that a specification teach that which is well known in the art. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81 (Fed. Cir. 1986) citing *Lindemann Maschinenfabrik v. American Hoist and Derrick*, 221 USPQ 481 (Fed. Cir. 1984), (“ . . . a patent need not teach, and preferably omits, what is well known in the art.”). As shown in the sequence alignment in Figure 2 of the subject application, the amino acids for wheat and barley corresponding to the histidine at position 333 of maize AGP large subunit were known in the art. As can also be seen from Figure 2, there is an extensive amount of homology of amino acid sequence between maize, wheat, and barley. Thus, Applicants respectfully assert there is sufficient written description for the claimed polynucleotides and that a person of ordinary skill in the art could readily prepare and use polynucleotides encoding mutant large subunit AGP of the invention for species other than maize. Accordingly, reconsideration and withdrawal of the rejections under 35 USC §112, first paragraph, is respectfully requested.

Claims 1, 3, 5-26, and 29-41 are rejected under 35 USC §112, second paragraph, as indefinite. Applicants respectfully submit that the claims are definite. However, Applicants have submitted new claims 42-84 and respectfully assert that the claims are not vague and indefinite. In regard to the Examiner’s assertion that the recitation of “biologically active fragment” renders claim 1 indefinite, Applicants respectfully assert that the claim refers to a fragment of the mutant polypeptide that has the same or substantially the same biological activity as the full-length mutant polypeptide. Applicants also respectfully assert that the new claims are definite in their recital of an “amino acid corresponding to position -- is replaced with” The ordinarily skilled artisan, having the benefit of the teachings of the subject application, would readily understand the metes and bounds of the claims. Applicants also note that the reference to “the native AGP enzyme subunit” has been deleted from the new claims submitted herewith. Applicants have also amended the claims to delete reference to “prairie grass.” Accordingly, reconsideration and withdrawal of the rejection under 35 USC §112, second paragraph, is respectfully requested.

Claim 1 is rejected under 35 USC §102(b) as anticipated by Ballicora *et al.* (1995). The Examiner asserts that the Ballicora *et al.* reference teaches a mutation in the small subunit of potato AGP that results in an enzyme with increased heat stability. Applicants respectfully assert that the Ballicora *et al.* reference does not anticipate the claimed invention. However, as noted in regard to

the rejection under 35 USC §112, Applicants have amended claim 1 to specify that the mutation is in the large subunit of AGP. The Ballicora *et al.* reference does not teach or suggest mutations in the large subunit of AGP that result in increased heat stability. Reconsideration and withdrawal of the rejection under 35 USC §102(b) is respectfully requested.

Claims 1, 3, 5, 30, and 37-39 are rejected under the judicially created doctrine of "obviousness-type" double patenting over claim 1 of U.S. Patent No. 6,069,300. In addition, claims 1, 3, 5, 15-17, 20-23, 26, 30, and 37-39 are rejected under the judicially created doctrine of "obviousness-type" double patenting over claims 1-3, 21-30, and 48-54 of U.S. Patent No. 6,403,863. As noted above, Applicants have canceled claims 3-41. Applicants respectfully assert that the new claims presented herein are not obvious over the cited patents. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

It should be understood that the amendments and new claims presented herein have been made solely to expedite prosecution of the subject application to completion and should not be construed as an indication of Applicants' agreement with or acquiescence in the Examiner's position.

In view of the foregoing remarks and amendments to the claims, Applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

Applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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